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DOCKET NO. D-70-53 CP

DELAWARE RIVER BASIN COMMISSION

City of Philadelphia Water Department  
Upgrading and Expansion of Southwest Sewage Treatment Plant  
Philadelphia, Pennsylvania

PROCEEDINGS

This is an application submitted on behalf of the City of Philadelphia Water Department by the Pennsylvania Department of Environmental Resources on October 31, 1972, for review of a project for the upgrading and expansion of the City's Southwest sewage treatment plant. The application was reviewed for inclusion of the project in the Comprehensive Plan, approval under section 3.8 of the Delaware River Basin Compact, and certification under section 21 of the Water Quality Improvement Act of 1970. A public hearing on this project was held by the Delaware River Basin Commission on December 12, 1972.

It is expected that the project will be approved by the Pennsylvania Department of Environmental Resources shortly.

The Delaware Valley Regional Planning Commission has been notified of pending action on this docket and has not expressed objection to approval by the Delaware River Basin Commission.

COMPREHENSIVE PLAN DESCRIPTION

Purpose. --The purpose of this project is to make additions and extensions to the existing Southwest plant to add new secondary treatment facilities designed to meet the required water quality standards in the Delaware River under estimated 1990 plant loading conditions.

Location. --The project will be located at the site of the existing Southwest plant at Penrose Avenue, just northeast of the Philadelphia International Airport, Philadelphia, Pennsylvania. The plant discharge is located in Water Quality Zone 4 at river mile 91.7.

Service area. --The proposed service area will consist of a total of 115,800 acres:

- (1) 51,600 acres now served by the Southwest Plant, composed of 27,200 acres within the City of Philadelphia (or about one third of all area within the city limits) plus 24,200 acres of suburban lands in the townships of Springfield, Lower Merion, and Upper Darby.
- (2) 52,200 acres in the proposed service area of Eastern Delaware County, as described in Docket D-72-8 CP "Delaware County Regional Water Quality Control Authority".
- (3) 12,000 acres of suburban lands located in Montgomery County adjacent to the City in the Wissahicken drainage basin.

The service area is shown in more detail on map numbered Fig. 2 in "Report on Design Studies" by Greely and Hansen, and submitted as part of this application.

The projected sewered population within the proposed service area is 1,355,000 for the design year 1990.

All of the subject area is served by approved public or private water supplies.

Physical features.

(a) Design criteria.—Average annual design flow is 210 mgd (118 from Philadelphia and 92 from suburbs). Maximum rate of flow is estimated at 420 mgd, double the annual average. Average wastewater characteristics for design are suspended solids, 279 mg/l, and BOD, 193 mg/l.

(b) Facilities.—In general, the existing primary treatment facilities at the Southwest Plant comprise of a pumping station, bar screens, grit chambers, aerated flocculation tanks, primary sedimentation tanks; separate sludge treatment and disposal facilities comprise of concentrators, preheaters, primary and secondary digestors, centrifuges, scum incinerators (presently under construction).

In order to meet treatment requirements for the design year 1990, secondary facilities are proposed to provide activated sludge treatment with oxygen aeration.

The proposed secondary facilities comprise of ten four stage aeration tanks with on-site oxygen generation; twenty final sedimentation tanks; a final effluent pumping facility equipped with tide gates; chlorination facilities; and provision for connections to tertiary treatment facilities, if required in the future.

Proposed modifications to the existing primary treatment system comprise the following: a new flow meter to a 66 inch force main; changes and additions to the raw sewage pumping station; new (replacement) preliminary treatment facilities (including screening, grit removal, and incineration of grit and screenings); an additional primary sedimentation tank with appropriate influent and effluent modifications. The existing primary sludge facilities will be modified to receive thickened secondary sludge pumped from the secondary facilities. The major modifications will consist of new separately equipped floatation units to thicken sludge before digestion; a scum concentrator; a scum incinerator; piping changes to provide varying modes of digester operation; i.e. modes determined by sludge mixture (loading and recycle rates), or by temperature, or by sludge chemical composition; and a storage tank for digested sludge.

The digested primary and secondary sludge will be withdrawn to sludge storage, or to existing centrifuges for thickening, or directly to barges.



Sludge from the Southeast Plant is now pumped to the Southwest Plant for digestion. Preliminary studies indicate that separate systems for sludge disposal may be employed at the Southeast and Southwest Plants. On this basis, it has been determined that the existing digestion facilities at the Southwest Plant will be adequate to provide digestion for Southwest Plant sludge alone, until about the year 1990. It is proposed to dispose of digested sludge at sea.

Proposed facilities include additional generators to assure sufficient emergency power to maintain all essential plant facilities and services.

Other.--The facilities are to be arranged to permit further expansion with addition of tertiary facilities if required beyond the design year 1990 to accommodate the expected population and industrial growth in the service area to the year 2020. The estimated loads on the treatment facilities at the Southwest Plant are summarized as follows:

<u>Year</u>	<u>Quantity, mgd</u>	<u>Annual average quantities</u>	
		<u>Suspended solids, lbs/day</u>	<u>5-Day BOD, lbs/day</u>
1972	135	300,000	135,000
1990	210	488,000	339,000
2020	285	690,000	518,000

The permissible discharge presently allocated to the Northeast Plant is 29,000 lbs/day of carbonaceous oxygen demand or 16,960 lbs/day of equivalent 5-day BOD. The proposed plant would be required to accomplish over 91% BOD removal.

Cost.--The overall cost of this project is \$84,825,000, of which \$46,653,750 will be a Federal grant.

Relationship to the Comprehensive Plan.--The Philadelphia Southwest Plant is presently included in the Comprehensive Plan (Resolution R-62-14).

### FINDINGS

The proposed project is designed to produce a discharge meeting the effluent requirements and stream quality objectives for Zone 4, as set forth in the Water Quality Standards of the Delaware River Basin Commission.

The project is expected to be completed by December 31, 1975.

Under the revised Abatement Schedule (A-70-2, Revised) approved by the Commission on July 26, 1972, the Southwest Plant improvements are to be completed and operating in compliance by March 31, 1976.

At the project site, the Delaware River is tidal and provides adequate dilution.

The project does not conflict with nor adversely affect the Comprehensive Plan. It provides beneficial use of the water resources, is financially and physically feasible, conforms to accepted public policy, and does not adversely influence the present or future use and development of the water resources of the Basin.

At the present time, regulations are pending pursuant to P.L. 92-500 and P.L. 92-532. Should these new regulations establish conditions more stringent than those now contained in the Delaware River Basin Commission's Comprehensive Plan and Basin Regulations Water Quality, the applicant will be required to satisfy the new requirements.

### DECISION

- I. The project, as described above, is hereby added to the Comprehensive Plan.
- II. The project is approved pursuant to section 3.8 of the Compact, subject to the following conditions:
  - a. Approval is subject to all conditions imposed by the Pennsylvania Department of Environmental Resources.
  - b. The plant shall be available at all times for inspection by the Delaware River Basin Commission.
  - c. The plant shall be operated at all times to comply with the requirements of the Water Quality Standards of the Delaware River Basin Commission.
  - d. If at any time the receiving wastewater treatment plant proves unable to produce an acceptable effluent in accordance with an approved abatement schedule, no further connections will be permitted until the deficiency is remedied.
  - e. Sound practices of excavation, backfill, and reseeding shall be followed to minimize erosion and deposition of sediment in streams.
  - f. Upon completion of construction of the approved project, the sponsor shall submit a statement to the Delaware River Basin Commission, signed by the sponsor's engineer or other responsible agent, advising the Commission that the construction has been completed in compliance with the approved plans and giving the final construction cost of the approved project.
  - g. The area served by this project is limited to the service area as described above. Any expansion beyond this area is subject to review in accordance with section 3.8 of the Compact.

III. The Executive Director is authorized to issue a certificate of compliance in accordance with section 21 of the Water Quality Improvement Act of 1970.

BY THE COMMISSION

DATED: December 12, 1972